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ACHILLES UNBOUND

1. Zeno's argument for his paradox of Achilles and the Tortoise may be stated somewhat as follows: We may assume that in all his races Achilles runs with a minimum velocity, m, and the tortoise, in all his races, runs with a maximum velocity, n, where $m > n > 0$; then, supposing we give the tortoise a headstart, a, Achilles cannot ever catch the tortoise, no matter how long the race-course may be; for, whenever Achilles has reached any position where the tortoise has been, the tortoise will have advanced some further distance; and, since Achilles must reach position a before he reaches the tortoise, he can never reach the tortoise. In order to simplify my presentation at certain points, I shall make use of a highly revised form of Zeno's other paradox of the Dichotomy: No one ever can finish walking across the room, because he must first have gone half way; and after going half way, he must then go an additional one-quarter of the way, *ad infinitum*.[1] According to tradition, Zeno cast his paradox into the form of a *reductio ad absurdum* argument designed to prove that the notion of motion is self-contradictory. He argued that if we can move from point A to point B, then we cannot move from point A to point B. Actually, it is important in each case that we know which place it is we are to get to, and where we start.

2. Let us first look at some of the more familiar "solutions":

2.1. Diogenes is reputed to have stood up and walked around a bit. Of course, we *may* do that; it is just what we *must* do sometimes. But such a refutation, if it shows that Zeno must have gone wrong, hardly shows where he went wrong; and *that* is the problem. It may be said, by the way, that any attempt to answer Zeno by elaborating an alternative positive analysis of motion [2] will fail in the same way, no matter how excellent the positive analysis may be.

[1] In its usual statement the Dichotomy purports to prove that no person ever can *begin* walking across the room because he must first go one-half the way; but *before* he can do that, he must have gone one-quarter of the way, etc. In my statement of the argument he cannot *finish;* in the usual statement he cannot *start.* We have, in fact, two different though related paradoxes; and observations appropriate to one will not always be appropriate to the other.

[2] As Aristotle did; see, e.g., *Physics,* VI, 1.

2.2. It is sometimes supposed that the paradox is resolved so soon as we realize that our perceptions of space, time, and motion have lower limits or minimal thresholds.[3] It is argued that, since we cannot become aware of Achilles approaching so close to the tortoise as we would need to do were we to follow Zeno's rules, it is impossible to obey the rules and they are nonsensical or (if you will) "operationally insignificant." But, if we cannot perceive so exactly as would be necessary actually to see Achilles overtake the tortoise, then it is immediately seen that Achilles will pass the tortoise during one of the minimal perceptual intervals.

True, perhaps; but hardly enough to refute Zeno. The problem does not concern our perceptions, but our conceptions. One would think that, after any one of Zeno's steps, it would always be logically possible that our perceptions would be sufficiently acute to discern the movements involved in the next step described by Zeno. In this way we would have what is substantially the same problem over again, only in different terms. Moreover, if the argument presumed by the refutation were a correct argument, it fails to be clear how it would ever be meaningful to speak of Achilles passing the tortoise, since we can never observe the exact point of passing.

2.3. A more popular current answer takes its cue from the Theory of Geometrical Progressions. We may, according to this theory, solve the Dichotomy (as I have stated it) somewhat as follows: Assuming the room to be one unit in length, each of Zeno's steps $\frac{1}{2}n$, is an element in a geometric series whose partial sums converge to the limit value, 1. Achilles and the Tortoise would be solved analogously.[4] In the final analysis this solution may vindicate itself. For, if we go along with Zeno's way of describing the race (which surely is a *possible* way of describing it), then part of *that* way of describing the race is that we will get our answer to the question when Achilles will catch the tortoise by application of the formula for summing geometric series.

Yet, stating it so simply as I have done, the geometric series solution is far from convincing. One wonders how it is that the mathematical device of equating an infinite series to a single number possibly makes the series any less infinite. This objection

[3] See, e.g., J. O. Wisdom's "Why Achilles Does Not Fail to Catch the Tortoise," *Mind*, Vol. L (1941), pp. 58–73.

[4] Let the velocity of the tortoise be n, and that of Achilles be m, where $n/m < 1$. Give the tortoise a start a. Now, the time it takes Achilles to reach the tortoise's previous position is, generally, an^{p-1}/m^p for the p-th step. But, by a well-known theorem, the partial sums converge to $a/(m-n)$.

is perhaps answered when the mathematician shows us the difference between a convergent and a divergent series; when he explains that by calling a series (better, "sequence") "convergent," he means (speaking very roughly) that we can, by going along the sequence, approach as close as we wish to a certain specific number. Still, to add cogency to this explanation, as it applies to Achilles and the Tortoise, we should have to show that a certain geometric series, whose terms represent intervals of time, converges step-by-step with another geometric series whose terms represent spatial intervals. (That the sequence of rational numbers ½, ¾, ⅞, . . . converges to 1, does not mean we shall eventually get to 1, if only we keep going long enough.)

But even so much is not enough. Notice first that we can conceive of a *random* sequence of steps, the partial sums of which, in the numerical representation of the sequence, would always be less than 1. But we cannot speak of such a sequence, in its numerical representation, converging to any particular number. However, in order to *state* the problem convincingly, we need some general rule enabling us to say "and so on." This shows, unless I am wrong, that the convergence of numerical infinite series representing problems like Achilles and the Tortoise is always presumed. So, let us grant that the sequence in question does converge; it still does not follow that (in my statement of the Dichotomy) the room-crosser will really get across the room. Suppose, for example, that Zeno had argued as follows: Before crossing a room, one must first go ⅓ of the way, and after that 1/9 of the total way, and after that 1/27, ... As one will easily verify, this sequence, while it does converge, does not converge to 1—the end of the room—but rather to 2/3. So the mere convergence of a geometric series is not enough in itself to prove that we ever can get to where we want to go.

2.4. The paradox is regarded as a manifestation of confusions over the notion of the infinite; and, it is thought, once we get clear about what different things are intended by "infinite" the problem will resolve itself.

2.41. Aristotle was, I think, the first to observe that Zeno was guilty of confusing two senses of "infinite": "infinite," in the sense of having a transfinite cardinal number; and "infinite," in the sense of being unbounded.[5] What Zeno has shown is that we may think of any finite bounded interval as composed of an infinite set of sub-intervals. Then, from the acceptable assumption that we are unable ever to pass over an infinite extent in a finite

[5] *Physics*, VI, 2, 23a, 22.

time, i.e., that we are in principle unable to traverse an infinite extent, Zeno fallaciously concludes that neither can we pass over a finite extent thought of as decomposed into an infinite set of sub-intervals.

Aristotle certainly observed an important distinction. But it is not perfectly clear that this observation is in itself yet adequate to the subtleties of Zeno's argument. For the traversal of any sub-interval will, it might be claimed, still consume a "bit" of time; and any infinite sum of "bits" of time cannot give a limited interval of time (but see above *2.3*).

2.42. Different and more elaborate analyses of Achilles and the Tortoise stem from Cantor's classification of the varieties of serial order. In this connection, the paradox has played a prominent role in discussions of what Russell once called "nearly the most difficult subject in philosophy," namely, that of the continuum.[6]

In its essentials that solution of Achilles and the Tortoise which stems from Cantor's theory revolves on the fact that the infinite sequence of finite (in length) spatial intervals which Zeno would have Achilles traverse is, though infinite, denumerable and discrete. Such a sequence is to be contrasted with the sort of ordered set of which the points of time allegedly constitute an example. The latter is non-denumerable and densely ordered. According to Russell, we must acknowledge the existence of such continuously ordered sets, and he cites the paradox as indicating an inveterate but fallacious desire to range all sets into discrete orders.[7]

Accepting all this, we may observe, first, that the correspondence which Zeno proposed to establish between the *points* of time and the infinite set of spatial *intervals* can never be established, since these sequences constitute examples of distinctly different sorts of ordered infinite sets.[8]

We may observe, secondly, that the points of both space and time are, in their usual order, continuously ordered. We cannot, then, ever speak of any given point of space or time as having an immediate successor; a continuously ordered set is everywhere-dense.[9] Zeno's statement of the paradox requires that we be able

[6] See *A Critical Examination of the Philosophy of Leibniz*, p. 109.

[7] *Principles of Mathematics*, Ch. XLII. See also *Our Knowledge of the External World* and "Mathematics and the Metaphysicians."

[8] Aristotle anticipated this point when he asserted: "the divisions of which time and magnitude are respectively susceptible are the same and equal" (*Physics*, VI, 2, 23a, 12).

[9] *Our Knowledge of the External World*, Chs. V–VII. See also *Principles of Mathematics*, Ch. XLII.

to speak of "next elements" in the sequence, and therefore presumes that we are dealing with a discretely ordered set. So, were we to heed Russell's admonitions, we probably would keep clear of the puzzle, for we should not wish to state the paradox.

But we *can* nevertheless easily circumvent the elaborate defensive apparatus called in by Russell; we *can,* that is, still state the paradox, although granting that both space and time are continuously ordered. We can do this by constructing an associate discrete series of points, in particular the end-points of a discretely ordered set of finite intervals numerically represented (for example) as 0–½, ½–¾, ... The infinite set of end-points is discretely ordered and each has an "immediate successor." In traversing an interval of length 1, we must "touch" each of the end-points. Moreover, the least upper-bound of the set, namely 1, does not belong to the set and we shall therefore never get to it. Finally, in passing from any one end-point to the next, we shall consume some finite "bit" of time, which again sets us to asking how we ever are to manage an infinite number of intervals of time in a finite total time.

One of the things I shall try to show below is that direct intercourse with the infinite is not required in order to get clear about Achilles and the Tortoise. The infinite belongs not to the race, but to its form of representation, to the manner in which we describe the race. And we can describe the race in language which has no place open for the notion of the infinite.

3. There is, I think, a clear and direct answer to Zeno, an obvious solution to Achilles and the Tortoise showing where and how Zeno has managed to delude us.

Assuming that Achilles will catch the tortoise, we know he must do it within some definite amount of time, which we could easily calculate, given sufficient information about the initial distance between the two contestants and the velocities of each. We know in particular that, if Achilles and the tortoise run with respective velocities of m and n ft./sec., then, if the tortoise is given a start of a ft., Achilles will catch the tortoise in precisely $a/(m-n)$ sec. Examining Zeno's argument in the light of this obvious result, we notice that at no single step in the process would Zeno yet have allowed Achilles sufficient time to have caught the tortoise.

What Zeno *has* shown is this: For any time *before* which Achilles has yet passed the tortoise, we can specify later times at which Achilles will still not have caught the tortoise. What Zeno gives us is a systematic way of calculating any number of points at which Achilles will not yet have caught the tortoise; given any

one of these points, Zeno shows us how to choose the next point so as to leave Achilles still short of his goal. To put it in another way: If we happen upon Achilles anywhere *before* he has caught the tortoise, we may be safe in betting him that he won't catch the tortoise in anytime less than $a/(m-n)$ sec., where "a" now refers to Achilles' distance from the tortoise at the time of the bet, and where "m" and "n" give Achilles' maximum and the tortoise's minimum velocities, respectively. We could, moreover, make howsoever many similar bets we wished, so long as Achilles had not yet reached his more sluggardly opponent. But this is not confusing, and hardly paradoxical—no one could wish to deny it. To suppose that the state of the case could be otherwise would be like trying to measure a 6-foot man with *any* (finite) set of rulers, such that each set contained only elements which were powers of ½ ft., under the prescription that each ruler could be used but once.

Similarly for the case of the man who really can walk across the room. Zeno would contrive, as it were, systematically to shorten the man's legs in such a fashion as to keep him from getting anywhere he might wish to go. The rule would, of course, vary according to the destination.

The point is most easily seen if we express it algebraically: Zeno contrives to lengthen each of the successive temporal intervals he plots for Achilles—he "slows down the passage of time"—so as to make each interval $[t_{n+1}-t_n]$ just as long as the previous one. Algebraically, he adopts a transformation something like $t = \log\{[a/a-t\ (m-n)]\}$, where a is the original distance between Achilles and the tortoise, m is Achilles' velocity and n the velocity of the tortoise, t is time and t' is "Zeno-time."[10] "Zeno-time" resembles in reverse the "absolute time scale"—based on the exponential law of radio-active decay—which physicists use when "measuring the age of the universe." However, with the physicist's clock we can date any event we choose—or so it is claimed; but Zeno's clock starts and stops with the race. What is now obvious is that the paradox requires us to use "Zeno-time," when in fact we do not do so; so there is no problem.

In describing the kind of course which Zeno plotted for Achilles I said that we could specify any number of points before which Achilles would not have caught the tortoise, and that we

[10] This is not the only transformation which will work. All that is required is that we have a 1–1 continuous, strictly monotonic transformation such that when $t=0$, $t'=0$, and as $t\to a/m-n$, $t'\to\infty$. We could give similar and equally suitable transformations on the velocities or distances, if we chose.

could specify howsoever many such points as we might wish. But, however many we specify, it will still be only a finite number of points. If we choose Zeno's way of specifying points at which Achilles will not yet have reached the tortoise, then each step in the process is a certain specific (finite) step. Now, I also said that, given any one of these points, we could after that point specify any number of points at which Achilles would still not have caught the tortoise; and we could specify as many points as we wished *between* any two points already specified. This shows that, if we choose to speak about the set of *all* possible points of the kind described, then we should have to say that this set is infinite and densely ordered. But we can easily state Zeno's paradox and solve it without ever having to speak about "the set of all those possibly specified points, before that point at which Achilles would have managed to catch the tortoise." It is partly for this reason that I say it is not at all *necessary* to bring in the infinite in connection with Achilles and the Tortoise.

4. A perhaps more interesting question is why it is that so many people have been so thoroughly confounded by Achilles and the Tortoise. What I suspect is that there are a great number of different shoals upon which one might easily go adrift when faced with Zeno's argument. Without pretending to settle the matter, let me throw out a few suggestions which will point to some of the more dangerous locales of logical confusion.

4.1. Some of the confusion surely derives from the way Zeno chooses his rule for charting successive stages in Achilles' advance towards the tortoise. Rather than saying that Achilles must, at each step, reach the previous position of the tortoise as determined by the formula an^{p-1}/m^p, Zeno might just as well have required Achilles to reach *any* place at all where the tortoise had been. If Zeno's reasoning were correct, then it would also hold no matter how we chose to plot Achilles' path (see *2.3* above). To so generalize the argument is almost enough to expose the fallacy in Zeno's reasoning. Zeno in fact tailored his argument to the conditions of the problem: Achilles must go to where the tortoise had been at the previous step, etc. So stated, the argument assures us that Achilles will get as close as he wishes to the tortoise, but never finally catch him; which seems puzzling. Of course, just that is required if we elect to use the geometric progression way of describing what would have been the race.

4.2. As suggested above, the "infinite" has been unnecessarily dragged in, and sometimes in such a way as to muddle the issue. Consider, for example, the following statement:

> Yet, if the segment of length 1 really consists of infinitely "chopped-off" wholes, then it is incompatible with the character of the infinite as the "incompletable" that Achilles should have been able to traverse them all. If one admits this possibility, then there is no reason why a machine should not be capable of completing an infinite sequence of distinct acts of decision within a finite amount of time, say, by supplying the first result after ½ minute, the second after another ¼ minute, the third ⅛ minute later, etc. In this way it would be possible, provided the receptive power of the brain would function similarly, to achieve a transversal of all the natural numbers and thereby a sure yes-or-no decision regarding any existential question about natural numbers! [11]

Dr. Weyl is, of course, being provocative. But let us for the moment adopt, as we certainly may, the complicated geometric series description of the race. Then this will provide us a formula with which, at any point before Achilles catches the tortoise, we may calculate as many other points as we wish which he will subsequently have to pass before catching the tortoise; but even with this description of the problem, it is never *necessary* that we speak of an infinite number of intervals or points. It may, of course, prove convenient to speak of "the infinite set of points (or intervals) which Achilles must traverse." But then we must try to keep clear about what is and is not implied by this way of speaking. What, then, is implied by this way of speaking? Simply that we have adopted a certain kind of language, a certain way of describing a race such that, e.g., it is nonsense to ask for the last step. To demand the last step would be like demanding of the physicist using the radio-active clock mentioned above: What happened before time 0? We should only ask this question, if, while using the radio-active clock, we were thinking about the use of our ordinary clock and calendar. To describe the race as a geometric series is not at all the same thing as to describe it as a sum of half the race-course plus the other half; but the race is the same race.

4.3. Weyl's statement strongly suggests that we may have been misled by a mistaken view as to the relationships between "time" and "times" (the French "temps" and "fois"). We erroneously conclude, in the case of Achilles and the Tortoise, that since we haven't time enough to count the temporal intervals in question, we cannot traverse them or the corresponding spatial intervals in any finite time. Zeno correctly shows that no matter how many *times* a certain rule is applied, a certain goal cannot be reached. He mistakenly concludes that there is not sufficient *time* to reach the goal. This is not merely an ambiguity on two like-looking words, for one presumes that the paradox could be stated in

[11] H. Weyl, *Philosophy of Mathematics and Natural Science*, p. 42.

French, where the corresponding words are totally dissimilar. What is true is that "times" suggests "time" in a way that it should not. But it is not true that traversing successive intervals is the same as counting them off. That such might be the case is misleading but strongly suggested by the statement of Achilles and the Tortoise, for what we are counting are temporal intervals, during each of which a certain spatial interval is traversed.

4.4. All of this points at what I think is the most important confusion of all, a matter several times hinted at but not yet broached directly. It is quite wrong to suppose that the mathematical representation of a situation gives, so to speak, a miniature model of that situation. In the present case we mustn't think that the sequence ½, ¼, ⅛, . . . is somehow a condensation of a process into numerals or into numbers; that the line of figures is, as it were, a replica reproduction of the race. What we have is a mathematical representation of the race; Zeno's description of the race simply cries out for such a representation; in fact it already is such a representation, ungraced with numerals and other mathematical signs. It is important to see that we could have had any number of other representations of the race. In any case, it is essential to be clear that the numbers we use do not somehow add up to starts, steps, and stops; but rather, are part of the logical machinery with which we choose to describe what would have happened had Achilles and the tortoise been available for the experiment. Numbers are the logical counters which we use to describe the process. Infinity enters not as a character of what we describe, but as a characteristic of the numbering system. Zeno has in fact read the infinitude of his numbering system into the race, when it is properly docketed as a character of the language with which he describes the race. Consider an analogous case: Is the use of the usual time scale a proof that the past is infinite? Is the use of the radio-active time scale a proof that it isn't? Neither, for either time scale would do the job. To draw either conclusion would be to read the logical properties of the language into the range of phenomena we choose to describe.

Now the mistake to which I allude is a very bad one, but a very easy one to fall into. It is one we make all the time when we talk about the application of mathematics. We even make it when we think about pure mathematics, where we read the application back into the theory. For instance, the idea that the natural numbers are posts in a line, unfortunately infinite in length; if only we had time enough to count them off; and perhaps we think of the Principle of Mathematical Induction as a way of

counting them off. It is worth observing at this point that infinite sets—even if denumerable—are not the sorts of things we count off. If we prove that a set is "countably infinite" we are warranted in concluding only that the set may be so arranged that we may count off *any* initial proper sub-segment.[12] But in any event, the fact that we do describe something as, e.g., a denumerably infinite set, means only that we are using a language which requires a value to be assigned to the function, $f(n)$, for every n, where the variable ranges over natural numbers.

4.5. The analogy of the two time scales points to yet another confusing feature of Zeno's argument, and this is again a matter at which I have several times hinted. Zeno's proof is supposed to have been a *reductio ad absurdum*. He said: Let us assume Achilles will catch the tortoise; he concluded that Achilles couldn't do it. When we try to trace the steps in this "proof," it crumbles in our hands; but we don't see quite where or why. Zeno begins by describing the race in a very ordinary way: Here is point A, there point B; given sufficient time and a certain speed, Achilles will run from A to B. But then as we follow the race it begins to appear that Zeno is describing it in quite another way. We might put it thus: He begins with linear equations and ends with a geometric series. The argument after the first step is in part designed to get us to look at the race in the second way.[13] But in fact the absurdity of this reduction proof is that Zeno wants us to look at the race in *both* ways. He changes the rules, changes the language, and the two languages clash. They clash just as would the two time scales referred to above if we were to try to use them both at the same time. At what place did we change languages? It's not clear, for the description of the race up to a certain point accords with both forms of representation. But in any case the change was effected unequivocally as soon as we stopped saying that the interval may be represented as equal to this part plus the remainder; that is, as soon as we said "etc." or wrote down the three dots.

I want only to add that if we adopt that particular way of describing Achilles and the Tortoise which is represented as a/m, $\ldots\ an^{p-1}/m^p, \ldots$, then of course we get the answer in a certain way, i.e., we apply the formula for summing a geometric series.

[12] See Max Black's "Achilles and the Tortoise," *Analysis*, Vol. 11 (April, 1951), pp. 91–101, where a similar point is made. It must be said, however, that Black's argument in support of this observation makes it somewhat less obviously true than it would at first appear.

[13] Zeno has sometimes been hailed as one of those who anticipated the mathematics of infinite processes; and he may very well deserve the encomium.

But if we adopt the more natural way of describing the race, we apply the rules for solving the linear equation $tm = tn + a$.

4.6. One of the reasons we may be puzzled by the geometric series representation of the problem is that we fail properly to distinguish "any" from "all."[14] To speak of "any step of the process" is simply not the same thing as to speak of "all the steps of the process." It may even be that there are occasions where it would be meaningful and true to speak in the first way, and simply meaningless to speak in the second way. In the present case: To pass from "After any step he will not have reached his goal" to "He will never have reached his goal" is something like passing from "After any step he will not have reached his goal" to "After all the steps he will not have reached his goal," and it is not perfectly clear what is meant by "all the steps."

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PREDICTION, PROJECTION, AND SOCIAL PROGNOSIS

THE purpose in this paper will be to compare long-range social projection with scientific prediction, and to assess the current and the probable future role of each in social prognosis. The point of references will be an essay contributed by Professor Simon Kuznets to the recent volume *Long Range Economic Projection.*[1] Kuznets' work is concerned with the concepts and assumptions of long-range social projection,[2] a subject upon which probably no other living economist or statistician can speak with equal authority.

In view of the symbolic significance commonly attached to the word "science," it is understandable that a practitioner and pro-

[14] The failure to distinguish "any" from "all" remains, despite Russell's noble but somewhat misdirected efforts in *Principles of Mathematics,* a bogey-man that haunts many parts of philosophy. This is especially true where these words are used in implicit conjunction with modal words like "may" and "can." Thus, from "Any statement is corrigible," the truth of "All statements are corrigible" does *not* follow. (Giving a longer translation this becomes obvious: the first is rendered: "For all x, if x is a statement, then it may be that x will be corrected"; the second is rendered: "It may be that, for all x, if x is a statement, x will be corrected.")

[1] *Long Range Economic Projections,* by the Conference Board on Research in Income and Wealth, a Report of the National Bureau of Economic Research (Princeton, 1954).

[2] Simon Kuznets, "Concepts and Assumptions in Long-Term Projections of the National Product," *Long Range Economic Projections,* pp. 9–42.

ponent of modern social projection, such as Kuznets, should find such projection to be related to and dependent upon "empirical science." Although he recognizes "the greener pastures of the experimental scientist," *bona fide* social projection is asserted as "statements about the future derived from tested or testable propositions about the past," and thus is segregated out of the presumably non-scientific world of mere "prophecies, utopian myths and hunches."

Disregarding that usage which finds "science" to be synonymous with all that is reasonable, rational, or rigorous, and using the term only to designate a particular approach to an understanding of aspects of the universe, and a particular method of organizing empirical data, there appears to be no identity in the basic nature and techniques of social projection and those of empirical science, but rather between the two there is an unbridgeable gulf. Modern social projection is a conceptual offshoot of man's most primitive approach to the understanding of his universe, one that not only predates science, but that probably predates and stands further away from the essential nature of empirical science than even those "prophecies, utopian myths, and hunches" which Kuznets holds up to scorn.

Empirical science postulates a relationship between x and y which, though not necessarily to be regarded as causal or immutable, is specific to x and to y, and which stands outside of history. Here historical time is wholly irrelevant; time is relevant only as the period required for the unfolding of the relationship. Sometimes x may be related to y deliberately "experimentally" under controlled conditions, but very often it cannot be, nor is this ability to conduct controlled experiments essential either to empirical science or to scientific prediction. What is required is that the relationship be definite, specific to x and y, and subject to refutation or modification where other than the postulated relationship in any of its manifestations or consequences is observed to hold. The assertion of this relationship subject to possible refutation *is* scientific prediction. Where empirical science is to be used for the prognosis of particular events, then the abstracted, generalized relationships of science, where they are relevant to observed or specific conditions, are reassembled with their total interpenetration and impact integrated and summed up in a single schema.

Projection does none of these things. Science abstracts and generalizes timeless relationships, which are reassembled for the specific prognosis. But the art of projection postulates no relationships, except those between historic event and historic time.

The generalizations of science stand outside of history, but the art of projection is immersed in historical time. The art of projection relies on an examination of the data of history for recurrent patterns of social phenomena and for continuing patterns of social change. Without probing the causes of past event or postulating relationships independent of the historic continuum, prognosis through projection is based on the supposition of a historical continuity in social phenomena and in the rate and direction of historical change. It is the fundamental presupposition that that which is will probably continue to be, that that which has occurred will probably recur, that a knowledge of historic change provides a gage of the variability of future event and within this range of variability (cumulatively widening as a function of historic time) the patterns of the past can be projected forward into time. Kuznets' so-called "testable propositions concerning the past" have not to do with a relationship which stands above time, and may be checked by reference to events which have occurred or are yet to occur, but have to do with describing the facts of historic event or change merely. The projector stands on the edge of historic time and, on the presumption that there is "an identifiable relation between the future and the past, and a minimum of order in the past can be translated into some specific pattern for the future," [3] looks into the future to perceive "a pattern that can, at best, be dimly discerned only a short time ahead; and that as the period is extended, the possible errors pile up so fast that the result is useless." [4]

Infinitely more reasonable, rigorous, knowledgeable, and sophisticated though it may be, the nature of Kuznets' approach to prognosis is fundamentally the same as that of the savage who expects the sun to rise on the morrow because it has risen after the blackness of every other remembered night, and who predicts that the moon will cover its face and after a passage of days and nights will uncover its face again, and that season will follow season—because so it has always been in the memory of the race, or as that of the magician who looks for omens and signs as a part of an unfolding and recurrent pattern of disaster or beneficence. However, when the savage sought otherwise to explain the particular events by hypothesizing supposedly causal and invariant relationships, though thereby he evoked the idea of demons and gods, or though x was for him a smashed token and y was bad luck, he was moving in fact forward towards science, and away from the simple art of projection. Why, then, does the art of projec-

[3] *Ibid.*, p. 11.
[4] *Ibid.*, p. 34.

tion, now grown complex and expert, rather than the techniques of applied science, dominate social prognosis? The answer is that no adequate science of society has yet evolved; projection dominates by default. Kuznets rightly decries the absence of an "adequate theory" of change and growth which would at least specify the critical relationships, let alone quantifying, testing, and establishing the stability of these relationships.

Insofar as the art of projection is concerned, Kuznets assigns to empirical science generally and to social "theory" in particular, a role which is, at best, meagre and peripheral. Empirical science, having "brought knowledge and understanding of the universe," is hence supposed to have helped yield "an empirically testable picture of order in the universe," which picture provides a secure philosophical foundation to the art of projection. Science, moreover, is supposed to have introduced a greater regularity or "order" into social phenomena through an increase in the conscious power of man over the physical world, e.g., over disease and birth, and hence science by its effect on the nature of phenomena is said to have increased the power of projection, since projection relies on the inherent regularity of phenomena. Thus, empirical science generally is supposed to have given support to the underlying notions of social projection by establishing the assumption of regularity, and to have made easier the practical problems of projection by introducing greater regularity into social phenomena. Both of these suppositions are open to very grave doubt.[5]

To make clear the role envisioned by Kuznets for social theory, i.e., for a dynamic model of social change, the method used by projectors to forecast future events must briefly be recalled. The standard technique for forecasting gross social aggregates, e.g., national production or income, is to project the trend in the

[5] While science certainly establishes the assumption of underlying regularities in relationship between elements of the physical universe, science certainly does not establish any assumption of a regularity in the relationship between social (or physical) phenomena and historic time. Nor can it be presumed that a knowledge of the laws of science introduces a greater regularity into the pattern of either social or physical change. For example, the use of a new drug may lower the death rate of those with a given disease from 100% to 40%, which decreases rather than increases the regularity of phenomena. Indeed, it might be supposed that a knowledge of the laws of science would generally increase the irregularity of social (and of physical) events over time, since these would thus be subject to a greater degree than before to the influence of human will (and political choice) with all that is unstable, whimsical, free, and unpredictable inherent in the personal and social decision.

change of the aggregate quantum as such, and separately to extrapolate the trends and project the components of the aggregate, checking the former against the sum of the latter, and considering the reasonableness of projected component changes either intrinsically or in relation to each other. A more adequate social theory would, for Kuznets, suggest the functional interdependence of specific components and thus would suggest a resaonable system for categorizing components of the selected aggregate, and would provide grounds for considering projected changes in a given component to be considered as a stimulating or limiting factor in changes assumed or allowed for other components. Investment, for example, has been functionally related to consumption, employment, and productivity. Postulating such a relationship, it is possible to judge the reasonableness of the simultaneous projection of several indices. Or, to use Kuznets' own facetious example of the manner in which a particular projection may be tested by reference to a given general relationship, the per-capita increase in the consumption of prunes, although meeting all the tests of mathematical trend fitting, may not be consistent with our intuitive knowledge of the bounds of personal satiety. An example of the need for the cross check of theory with projection is provided by the perennial attempts of the investment analysts and so-called business economists to foresee changes in the prices of securities. At the time of the writing of this paper (January 1955), we are being told that security prices are not unreasonably high and may be expected to go much higher *because* stock market prices have not increased as rapidly as has national income. Aside from mere correlation, the acceptability of such a projection depends on whether we conceive of a causal relationship between security prices and a growth in the national product. In fact, no relationship of this sort is evident in any systematic conception of the economy, any more than there is a necessary relationship between growth in the national product and price change generally.

That social prognosis is now carried on predominantly through the art of projection does not mean that this must be or always will be the case. The mutability of social relationships and the pervasive freedom and creativity of man combine to make very difficult the structuring of a science of society and (in our view) render it impossible that social prognosis should ever be of the nature of "unconditional" prediction. Nevertheless it appears that social prognosis is more closely approximating the scientific prototype, at least in dealing with economic phenomena. This is especially well instanced in the case of Leontieff's Input-Output

Analysis,[6] where a complex of critical relationships in the determination of economic change and growth have been postulated, e.g., between product output and factor input, between factor input and factor income, between factor income and product consumption, between consumption demand (i.e., output of consumer goods) and investment input and output, between investment output and productivity, and where the attempt has been made to cross check these specific, quantified relationships against technological data and against predicted events.

While it is certainly not likely that projection will be dispensed with as a basic technique of social prognosis in the foreseeable future, it might well be expected that theory and "science" will be less mere conditioners and technical aides to projection, but rather that projection will provide the outlying parameters for a prediction which will essentially rely on the relationships postulated and tested in the frame of general social theory.

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BOOK REVIEWS

Inquiry Into Inquiries; Essays in Social Theory. ARTHUR F. BENTLEY. Edited and with an Introduction by Sidney Ratner. Boston: Beacon Press [1954]. xvi, 365 pp. $6.00.

Arthur F. Bentley has long been a kind of philosophical maverick. His academic contacts have been sporadic. He has earned his living as a newspaper reporter, writer, and business man. He has, in other writings, made significant contributions in economics, sociology, government, mathematics, and psychology. Perhaps it is this breadth of experience, and relative freedom from professional routine, which contribute to his characteristic vitality and literary freshness.

This book is a collection of twenty essays, written between 1910 and 1950, some not previously published. As is probably inevitable in a volume of this kind, there are numerous repetitions and some lacunae. It would have been better, of course, if the material could have been revised or re-organized, but Bentley, now 83 years of age, has begged off.

[6] Cf. Wassily Leontieff, *Studies in the Structure of the American Economy* (New York, 1953).

No philosophical "system" emerges from these pages. However, there is a consistency of approach which lends coherence to the basic ideas and attitudes.

It is perhaps a characteristic *leitmotif* of our philosophic era to oppose untenable dualisms and functionless dichotomies. Thus one of Bentley's major preoccupations is pointing out the fiction of the separability of the organism from its environment, and the individual from its society. Bentley builds his position on William James' emphasis on immediate or pure experience; he is also influenced by Dewey's famous paper of 1896 on the reflex-arc concept. "Behavior" is for Bentley the proper unit for study. "Behaviors are represented as organic-environmental events of natural occurrence, never as possessing presumptively internal organic location in presumptively separate organisms" (p. 296). "Organism" and "environment," like "individual" and "society," need to be re-defined, jointly. What is "an individual"? If it is a totality of certain habits, tastes, activities, and information, how sharply can it be demarcated from "society"? Can we understand what is meant by "Jack-in-love" unless we know about "Jill"? Genetics and physiology tell us that the "individual" endures not only through time, but through generations. Biology tells us of such species as Obelia, in which we do not know whether we are observing a colony composed of individuals, or an individual with separable cells. Most significantly, Pavlov's salivating dogs showed that "the region in which the physiological event took place . . . was literally wider than any region enclosed by a skin" (p. 201). Thus the boundary lines of the individual organism are fuzzy, and transcended in various ways. Psychology and sociology are to be fused, as physics and chemistry have been. Just as physics no longer speaks of "corpuscle vs. radiation," and cytology has abandoned "cell vs. environment," Bentley says we are to refer only to "organism-in-environment" as the biological and sociological fact. In effect, Bentley is declaring not merely that the monads have windows, but that it is doubtful if there are monads.

With this emphasis on "organism-in-environment" as the basic fact, there goes a re-interpretation of the knowing experience. For Bentley, as for Dewey (with whom there has been a continuing reciprocal influence), knowing is not an *inter*action between an independent knower and an independent object, but rather a *trans*action. Bentley is a thoroughgoing naturalist. Knowing for him is not something inexplicable or wonderful, but a type of natural behavior. Man as a knower is a part of the world as it is known. To ask where knowledge is located, is to utter

meaningless words. The "sight-seen" is the natural event (Bentley pays tribute to Woodbridge). Bentley abandons such terms as "knowledge," "mind," and "consciousness." For him, these are as outdated as the Newtonian particle. Knowing is something that happens in a certain biological-sociological region, not within a separate organism. "The knowing and the known form together one behavioral transaction in a common activity of organism-in-environment or environment-embracing-organism" (p. 299). "The present age is one in which a basic 'I' which 'sees,' and a basic 'it' which 'is seen,' are both devices which have fallen into disrepute because of their failure to do sound work" (p. 149). One of the essays reprinted in this volume is Bentley's well-known "The Human Skin: Philosophy's Last Line of Defense," in which he scoffs at the skin, which traditionally separated knower from known, and which "demarcates those bits of the universe destined to sing in the hereafter, and those destined to singe" (p. 196).

In line with this approach to knowledge, Bentley denounces the term "concept," which he considers a "weasel word" indicating a "bit of consciousness" (p. 103). "The physicist," he declares, "is closer to an electron than he is to a concept; he is closer to a light-wave; he is closer to a probability-wave" (p. 124). Bentley also attacks the fiction of the "retinal image," which "has no *where* and no *what*" and is "a survival from the behavioral mythology of the past" (pp. 282–283). He is a strong supporter of Pavlov and the early Bridgman, and opposed to vitalism, Abelard, Margenau, and Lindsay.

If behavior is not to be isolated within an organism alone, but in some sort of situation, it will require, says Bentley, a new behavioral space and time. This will be not merely physical, physiological, psychological, or social. It will aim at the viewpoint of such modern sciences as ecology or criminology. What, exactly, will it be? Behavioral space-time will "set forth the factual extensions and durations of the behaviors themselves. The behaviors are present events conveying pasts into futures. They cannot be reduced to successions of instants nor to successions of locations" (p. 222). Now this program is ambitious, but vague. It is really no more than a manifesto. Bentley is aware of his inability to supply details, and details are too much to expect at this stage of the game. However, the whole idea of a behavioral space is insufficiently clarified. Bentley refers to the previous ideas of Geddes, von Wiese, Koffka, and Simmel. He shows that "family," for example, can only be understood in a "social space." He points out the inadequacy of mathematical or physical space for the description of social phenomena. And yet I have the sus-

picion that "behavioral space" is one of those *entia* which *non multiplicanda sunt.*

Bentley also considers the relations between logic and psychology. He believes the distinction between them to be academic or pedagogical, since they must be studied in a common human behavioral setting. Just so is the distinction between biology and physics transcended by biophysics. In an approach similar to Dewey's, he calls logical behavior "language developing in guidance of itself" (p. 310). Logic he defines as "a name for certain critical procedures of appraisal" (p. 292) and "the Inquiry which examines this control of earlier language by later language" (p. 318). Now this point of view, I submit, does not go far enough or deep enough. Bentley says, "the distinctions analytic-synthetic, rational-empirical, universal-particular, take on new appearance in transactional construction" (p. 298). True enough, but exactly what does happen, and why, to these distinctions? He speaks, not too precisely, of a "linguistic spectrum" of factuality (p. 60). Is this altogether adequate, in view of contemporary studies in the nature of logic and the sciences? This remains a stumbling block to the success of Bentley's behavioral logic.

Bentley criticizes logical positivism, though admittedly sympathetic with its objectives. Carnap draws his fire, oddly enough, considering what has just been stated, for failing to distinguish sharply enough between object sentences and syntactical sentences. Feigl is also castigated. Bentley goes along to some extent with behaviorism, but criticizes Watson for retaining "the individual behavioristic agent" and the sharp boundary line between Stimulus and Response.

Language, for Bentley, is a manner of behavior of organisms in a known world. "All behavior, when transactionally viewed, may be described as sign-process" (p. 297). Building upon Peirce, Bentley feels that signs are as typically characteristic of behaviors as gravitational effects are of physical processes. And "meanings" have no independent subsistence; they cannot survive human life-in-process. They are events in human behavior, not observable apart from man's linguistic activity. Does this do full justice to the position that two plus two will equal four after men disappear from the world?

Bentley attempts to draw a comparison between the problems of an adequate postulate system for mathematics (avoiding the paradoxes), and the basic problems of sociological theory. Thus he refers to the "identity of problem centering around the presentations 'one' and 'some' and 'all' in mathematics and sociology" (p. 55). Now this idea, like many of Bentley's ideas, is bold and

imaginative; but how fruitful is this analogy? Is it not rather confusing to say "the operative constructions which the one uses are point and infinite space, and those which the other may comparably use are individual and society" (p. 91)? And "systems of co-ordinates may be aimed at in social spaces with exactly the meaning and value they have in mathematics" (p. 95). To transfer a term like "dimension" from mathematics to sociology—is this more than a mere *façon de parler,* and a dubious one, at that? The use of mathematical foundation theory undoubtedly imparts to social theory a measure of lustre and prestige—but what else?

Two aspects of the biological approach to knowing are worthy of comment. First is a certain amorphousness in the term "knowing" itself. Thus Bentley remarks, "an insect is said to know its way around" (p. 341). Surely this is a doubtful use of the term. Can a plant be said to "know" where the sun is? Secondly, Bentley's approach seems to me to result in a latter-day idealism, although he would deny it, and his attack on Margenau is essentially an attack on idealism. But what other conclusion can be drawn from such statements as these: " 'nature' now became framed in man's behavioral activity" (p. 293); "to say today that the electron is an 'entity' known to be such on its own, outside of and apart from the processes of its being known, would be to misrepresent modern scientific report" (p. 345); "any physical field theory . . . will . . . show itself to be a process of knowing, as clearly as it shows itself to be a system of the known" (p. 349).

A final word of praise must be said for Bentley's literary style. It is a rare pleasure to read such sentences as these: "Margenau's . . . theoretical interpretation has as little to do with physical science as a cutaway coat at a wedding has to do with the simpler facts of life" (p. 134). Mathematical logic is "still keeping life in bits of ancient witchcraft as it travels its path through the Valley of the Shadow of Antinomy" (p. 310).

Sidney Ratner has performed a great and valuable service in selecting and editing these essays. He has also contributed an excellent biographical and critical introduction, and a bibliography.

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Essays on Sociology and Social Psychology. KARL MANNHEIM. Edited by Paul Kecskemeti. New York: Oxford University Press, 1953. viii, 319 pp. $6.50.

This second of two posthumously edited volumes of Mannheim's shorter essays will be of value primarily in filling lacunae in the

reconstruction of Mannheim's thought. Since Mannheim's death in 1947, the following works have been published: *Freedom, Power, and Democratic Planning* (1950); *Essays on the Sociology of Knowledge* (1952); and the present volume of essays. A systematic work written in the early 1930's is to be the final publication.

This volume makes it possible to identify three distinct stages in Mannheim's thought. There is the historicist stage, familiar to readers of *Ideology and Utopia* (New York, 1936), in which ideologies are functions of social structure. It is left to the dynamic of history to effect a synthesis of conflicting perspectives, either through the self-conscious rationality of certain individuals or groups whose social location makes them "carriers" of synthesis, or through gradual group amalgamation. Also familiar to American readers is the succeeding stage of Mannheim's thinking, in which, a refugee from Nazism, he argues for the use of social techniques for the preservation of freedom. (Cf. *Man and Society in an Age of Reconstruction* (1940), *Diagnosis of Our Time* (1943), *Freedom, Power, and Democratic Planning* (1950).) If history is to be controlled, not merely intellectually intuited, then standards for evaluating historical developments must be found. Psychoanalysis is the field to which Mannheim (in anticipation of many other relativistic social scientists) turns to find constants to serve as such critical standards. Social psychology, in turn, becomes the science basic to planning.

But a stage in Mannheim's thinking prior to these two stages is revealed in the first essay in this volume, "Structural Analysis of Epistemology," his doctoral dissertation, published in 1922. The reader who, having been misled by the heading under which this essay falls, "Structural Analysis in Sociology," expects an excursion into sociology of knowledge, will be startled to find here a neo-Kantian logical approach to epistemology, including a formal concept of validity coupled with stern admonitions against the genetic fallacy, a transcendental-logical subject, transcendental *versus* empirical levels of thought, the deduction of *a priori* possibilities, etc. Yet in this abstract thesis there are adumbrations as well as identifiable antecedents of the later sociologistic stage. There already appears Mannheim's persistent thought-model, the methodology of the history of art, in which styles of art are categorized by their specific historical conditions, and any given art form may readily be dated and placed. Epistemology is made dependent upon other (although formal) areas of thought for its analytical materials as well as for its criteria of truth. The key concept of the essay is systematization (series of related concepts). The meaning of any concept can be ascertained only by finding

its structural place in the "currently accepted orders, series, levels." It is doubly unfortunate that the editor found it necessary, for reasons of space, to omit this essay from the preceding volume, *Essays on the Sociology of Knowledge,* yet included there his helpful introductory remarks concerning it.

"Conservative Thought" (published in Germany in 1927) is perhaps Mannheim's most successful single work, and its availability in translation will be of special interest in the current revival of conservatism in this country, as well as to students of Mannheim. Mannheim is at his best in interpretive understanding, in the power and depth of his perception of concrete relationships between specific social groups and their modes of thought (hence the brilliant insights, the fertile footnotes); he is somewhat less satisfactory in methodological and organizational ability (whence his most impatient critics). "Conservative Thought" is limited in scope to the development of conservatism in Germany in the first half of the nineteenth century—"one period, one country, one social group." Although he is already in his historicist stage, the conceptual structure is for the most part still the simple one borrowed from history of art: "styles of thought" and their "basic intentions." This study of the counter-revolution of German romantic conservatism against rationalistic capitalistic liberalism provides the key to Mannheim the historicist. This is clearly the empirical material he knows most intimately. This is the concrete ideological conflict he generalized (in his historicist stage) into a sociological theory, a philosophy of history, and a sociology of knowledge. This is the concrete source of his pre-Nazi optimism with regard to synthesis: the insight that the conservatives' "discovery of history," the meaning of growth, tradition, continuity, and their social organicism may be accepted without thereby necessarily surrendering the scientific, progressive, systematic self-determination of rationalistic liberalism. This is the synthesis that he conceives himself to have worked out in his own thinking. This concrete conflict is thus also the source of his historicist position that every viewpoint (even that of anti-intellectualistic, particularistic, backward-looking, parochial conservatism) perceives things of value (historicism, organicism, spiritual depths, etc.) not perceived elsewhere.

"The History of the Concept of the State as an Organism," is obviously a thesis which Mannheim must have projected at the same time as "Conservative Thought" (1927), but the writing was put off until his English period, perhaps as late as 1940 (the editor gives no date for this previously unpublished paper). His thesis is that conceptual change, in politics as in the sciences, is

brought about only by practice, and that the taking over of the biological concept of organism by social and political thinking is not a case of simple borrowing. The essay will be disappointing to anyone in search of a carefully documented history of this concept. What Mannheim does give a detailed analysis of is one episode: early German conservatism (especially in the works of Adam Müller) in conflict with the liberal Enlightenment, here interpreted as the conflict between the concepts of political organicism and political mechanism. Once again we perceive his key empirical base, perhaps his only well-documented historical material.

Among the sociological essays "German Sociology (1918–1933)," published in 1934, presents material new to American readers. It is a touching and eloquent "picture of the inward vitality of the sociological movement in Germany at the moment of its collapse." This detailed account of the various areas of German sociology and their important contributors is a companion-piece to Mannheim's well-known critique of American sociology, his review (*American Journal of Sociology,* Vol. 38, 1932) of Rice's *Methods in Social Science,* reprinted in this volume. In his review he finds American sociology suffering from an excessive "methodological ascetism," an over-attachment to natural science, a mistrust of theoretical construction, and especially of philosophy, and thus from a narrow, practical empiricism incapable of dealing with social and political problems concerning the whole of social life. Methodology can be unambiguous where the typical question is "what should one do to find out this or that?" American sociological methodology impresses Mannheim as "conferences in a workshop where the opinion of a foreman on a piece in construction is immediately understood by everyone." By contrast, the long philosophic tradition in Germany has trained through many generations a constructive imagination able to perceive the structural relationships and comprehensive unity of social phenomena. Acknowledging that the philosophic tradition may have too strong a hold upon some German sociologists, he insists, however, that in the younger generation "we can discern a real striving after empirical investigation, although this empiricism is a complicated conception." "There were hardly ever two different styles of study so fit to supplement each other's shortcomings as are the German and American types of sociology."

"Planned Society and the Problem of Human Personality: A Sociological Analysis" is a series of four lectures, previously unpublished, delivered at Oxford in 1938. "Whether we like it or not, planning—though, I hope, not dictatorship—will come to the democratic countries of Europe and America." On this assump-

tion, Mannheim takes as his problem the effect of planning upon the personality. He argues on behalf of planning for freedom, i.e., for social techniques which will safeguard "individualization," the "spontaneity," "free development," and self-determination of the individual personality. Presumably the logic of his argument is that the spontaneity (as vs. frustration, repression, etc.) concept of psychoanalysis is a constant which is adaptable as a standard for evaluating political events, specifically, for defending democratic individualism. He fails, however, to raise the crucial structural historicist question of the relationship between the psychoanalytic spontaneity concept and democratic individualism. Finally, one is left, on reading these Oxford lectures, with the feeling that although Mannheim faithfully acquired a knowledge of the Freudian mechanisms, he was never able to bring it to bear upon concrete social thought and action, the domain of his own psychological insight. He has learned the Freudian language, but he cannot think in it.

Dr. Kecskemeti has provided a valuable introduction which surveys Mannheim's career and skilfully places these essays with regard to it. He is responsible for the excellent translations, as well as for the selection of these papers. I believe it would have been helpful to make the dates of these essays (whether of writing, in the case of the unpublished ones, or of publication) more accessible to the reader; one date is to be found only in the editor's introduction; one appears only in footnotes in the body of the text; two conflicting dates are given for one essay, and in the case of another no date is given at all. I noted the following errata: p. 107, l. 26, *be* is omitted; p. 168, footnote 4, l. 3, "Malebrauche" instead of "Malebranche"; p. 173, l. 10, reads "work or art" instead of "work of art."

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The Portable Nietzsche. Selected and Translated, with an Introduction, Prefaces, and Notes, by WALTER KAUFMANN. New York: The Viking Press, 1954. x, 687 pp. $2.50.

Professor Kaufmann has put all English-reading students of Nietzsche in his debt by this admirably contrived and executed addition to the Viking Portable Library. He presents his translations of the complete texts of four works—*Also Sprach Zarathustra, Der Antichrist, Götzendämmerung,* and *Nietzsche contra Wagner*—with brief selections from twelve other works and numerous notes and letters characteristic of Nietzsche. In the choice

of the contents of this enormously useful volume, in his illuminating editorial comments, and, above all, in his translations, Professor Kaufmann displays the same scholarly judgment and taste which his previous study of Nietzsche had revealed.

Though considerations of space prevent lengthy quotations, two brief citations from Kaufmann's rendering of *Thus Spoke Zarathustra* should illustrate the quality of the translation and clarify its merits better than further words of praise. I choose, from Part II, the beginning of the chapter "On Priests":

> Once Zarathustra gave his disciples a sign and spoke these words to them: "Here are priests; and though they are my enemies, pass by them silently and with sleeping swords. Among them too there are heroes; many of them have suffered too much: therefore they want to make others suffer.
>
> "They are evil enemies: nothing is more vengeful than their humility. And whoever attacks them, soils himself easily. Yet my blood is related to theirs, and I want to know that my blood is honored even in theirs."

Compare this with the Thomas Common translation which the Modern Library took from the Complete and Authorized English Translation, edited by Dr. Oscar Levy:

> And one day Zarathustra made a sign to his disciples and spake these words unto them:
>
> Here are priests: but although they are mine enemies, pass them quietly and with sleeping swords!
>
> Even among them are heroes; many of them have suffered too much:—so they want to make others suffer.
>
> Bad enemies are they: nothing is more revengeful than their meekness. And readily doth he soil himself who toucheth them.
>
> But my blood is related to theirs; and I want withal to see my blood honoured in theirs."

Or take this introductory paragraph of "The Honey Sacrifice" of Part IV:

> And again months and years passed over Zarathustra's soul, and he did not heed them; but his hair turned white. One day when he sat on a stone before his cave and looked out—and one looks on the sea from there, across winding abysses—his animals walked about him thoughtfully and at last stood still before him.

The corresponding passage in the Common version evidences many of the defects for which Kaufmann criticizes the early translations "with their many unjustified archaisms, their 'thou' and 'ye' with the clumsy attendant verb forms, and their whole misguided effort to approximate the King James Bible." Dr. Kaufmann himself calls attention to some genuinely Biblical qualities of Nietzsche's style but he avoids the pseudo-poetical mannerisms of the standard version without, I think, losing the poetry inherent in Nietzsche.

My only serious criticism of Dr. Kaufmann's work concerns *Der Antichrist* and, specifically, his translation of the title. I raised the point in a review of his earlier book in this JOURNAL, perhaps unfairly since he had called the reader's attention to the ambiguity which the German term involves and which cannot be duplicated in English. Certainly no statement of the issue could improve on the one which Kaufmann now presents in his Editor's Preface on page 565:

> The title is ambiguous. It first calls to mind the apocalyptic Antichrist, and this more sensational meaning is in keeping with the author's intention to be as provocative as possible. But the title could also mean "The Anti-Christian," and this interpretation is much more in keeping with the contents of the book, and in sections 38 and 47 the word is used in a context in which this is the only possible meaning.

The concluding sentence of this statement seems to me to be conclusive evidence in favor of the translation, *The Anti-Christian*, which I prefer, a preference which I share with George A. Morgan.

But this is a relatively small matter in view of the large achievement of the Portable Nietzsche. Is the implication of the adjective, "portable," that other editions are *insupportable?* It would be a supportable implication in view of earlier translations of Nietzsche. Be that as it may, Professor Kaufmann's work is a first-rate contribution and a bargain for the general reader as well as for all students of philosophy.

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Guglielmo d'Occam. CESARE VASOLI. Firenze: La Nuova Italia [1953]. vi, 338 p. (Biblioteca di cultura, 50.) L. 1200.

Despite the fact that as late as 1947 Maurice De Wulf still condemned the Venerable Inceptor as a negative and destructive force, recent scholarly research has clearly established that the picture of Ockham as the diabolical subverter of the great 13th-century syntheses, the opener-of-the-door for doubt, free-thinking, and atheism, is a grave distortion. This distortion has been considerably redressed by the work of E. A. Moody, Abbagnano, Baudry, and Father Boehner and his colleagues in the Franciscan order (to name but a few), but the redressing pendulum has occasionally swung too far in the other direction, and Ockham has been found to be not only the founder of British Empiricism, but also the anticipator of Galileo and the starting point for much of the philosophical achievement of the 17th to the 20th centuries. Vasoli's book has some tendencies in this direction, but generally

manages to adhere to its stated intention of attempting to see Ockham in his own social and intellectual milieu—not as the malignant destroyer of the scholastic synthesis, and not as the inspired forerunner of most things modern. It has recently become clear that Ockham was not the destroyer of any synthesis, but rather that he offers the culminating statement of a conflict inherent in the whole mediaeval philosophical enterprise: namely, the essential impossibility of dealing with the Christian experience by means of the categories of Greek philosophy. As Vasoli notes, this difficulty appeared at least as early as Eriugena, and it reappears regularly (Abelard, Siger of Brabant, for example) right down to Ockham himself. The introduction of Aristotle to the West accentuated this difficulty sharply, and we find in Ockham perhaps its starkest presentation. Of course, the so-called "theory of double truth" advocated by philosophers called "Averroist" ought also to be taken as the expression of thinkers genuinely agonized by this ultimately insoluble problem. And certainly the agony is evident in the intellectual schizophrenia of later figures such as Jean Gerson and Pierre d'Ailly—simultaneously nominalists and mystics. If Aquinas' magnificent attempt to resolve this conflict had been successful, there would have been little need for a Scotus, an Ockham, a Jean Buridan, a Jean de Jandun.

Vasoli attempts what is too little attempted, because of its enormous difficulty, namely, to present Ockham's philosophy as a coherent whole, with the polemical political writings falling consistently in with the commentaries on Aristotle and on the Book of *Sentences*. (Of course, Vignaux and Baudry have previously developed similar enterprises.) And Vasoli attempts more: to show the close relationships between Ockham's theoretical system and the immediate practical affairs with which he was so intimately involved—the Church-State conflict raging between Pope John XXII and Ludwig of Bavaria, for one, and the split within the Franciscan order on the poverty issue, for another. Ockham is at once supplying, paradoxically, a philosophical expression of, and a theoretical foundation for, the profound social and political changes that were convulsing Europe at the beginning of the 14th century. How does our author attempt to build up these relationships? He selects as crucial William's emphasis on the central importance of the individual substance—as the primary reality, directly knowable, significant in its own right. This centrality of the individual substance in logic and metaphysics is transmuted, in the practical sphere, into Ockham's adherence to the spiritual faction among the Franciscans, with its insistence on the fundamental importance of the individual experience of God,

and into his adherence to the party of Ludwig of Bavaria, with its insistence on the autonomy and independence of the temporal authority.

What degree of success can be assigned to Vasoli's attempt? His suggestions are certainly far more than merely possible, yet adequate documentation is sparing and, even when introduced, often seems taken out of context or unsatisfactorily interpreted. In a word, it is generally very difficult to determine whether Vasoli is presenting Vasoli or Ockham. These remarks are by no means intended to detract from the interest or suggestiveness of the author's theme, but only represent my own feelings of reservation as to whether a completely solid case has been established.

Furthermore, Vasoli, while apparently aware of the dangers involved, has sometimes succumbed to the temptation to stress the novelty of Ockham's contributions and the sharpness of his break with the past. Yet surely the seeds of his doctrine of individual substantiality can be found in Duns Scotus (suggested but not made too specific by Vasoli), Peter Aureoli, Durandus of Saint Pourçain, and other immediate predecessors. There is perhaps as much mediaeval as modern in William of Ockham, and certainly he himself thought that he was maintaining Aristotle by purging him of certain "modern" Platonic accretions.

Possibly this is straining too much; for Vasoli's book is an energetic and acute discussion of Ockham, plausible and full of insights.

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NOTES AND NEWS

The Josiah Royce Centenary was celebrated at the Josiah Royce Auditorium, University of California at Los Angeles, on Sunday, July 31, 1955, under the sponsorship of the Department of Philosophy of the University of California at Los Angeles and the Foundation for Idealistic Philosophy. J. W. Robson, Acting Chairman of the Department of Philosophy, University of California at Los Angeles, presided, and "Remarks on the Josiah Royce Centenary" were presented by Daniel S. Robinson, Director of the Foundation for Idealistic Philosophy. The Josiah Royce Centenary Address, under the title "Royce's Synoptic Vision," was delivered by Jacob Loewenberg, Professor of Philosophy, emeritus, University of California, Berkeley.